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REVIEW OF THE SAWFLY GENUS *ERIOCAMPIDEA* (HYMENOPTERA: TENTHREDINIDAE)

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Abstract.—The male and larva of *Eriocampidea arizonensis* Ashmead are described. The foodplant is *Pteridium aquilinum* (L.) Kuhn, bracken fern. The life history in south central New Mexico is descibed, and new distribution records are given from Durango, Mexico. *Eriocampidea* **chiapasensis**, n. sp., is described from southern Mexico. A key is given to separate the two species.

When the senior author revised the North American Selandriinae (Smith, 1969), only several females of *Eriocampidea arizonensis* were available for study. Subsequently, we have obtained males and larvae with definite host data and additional distribution records from Mexico. The addition of a second species from southern Mexico indicates that members of *Eriocampidea* feed on ferns at high elevations from southern Arizona and New Mexico south to Chiapas.

The junior author spent the summer of 1979 in New Mexico and found the males, larvae, and host for *arizonensis* (fieldwork in New Mexico was supported by a Scientific Investigations grant from the Royal Society, London). Other specimens for this study were supplied by Gary Gibson and Henri Goulet, Biosystematics Research Institute, Agriculture Canada, Ottawa; Paul H. Arnaud, Jr., California Academy of Sciences, San Francisco; Verne Pechuman, Cornell University, Ithaca, New York; and D. W. Webb, Illinois Natural History Survey, Urbana.

References to original descriptions are found in Smith (1969).

Eriocampidea arizonensis Ashmead
Figs. 1, 4–6, 10–16

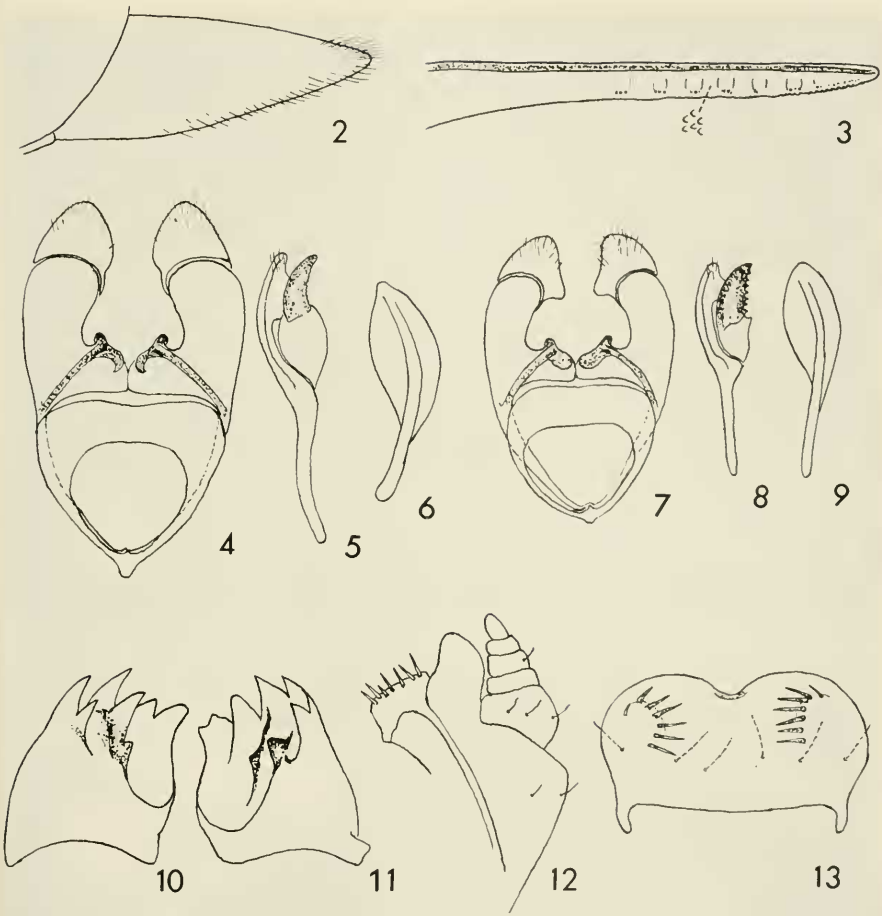
Female.—As redescribed by Smith (1969).

Fig. 1. Distribution of *Eriocampidea arizonensis* (circles) and *E. chiapasensis* (triangles).

Male.—Length, 5.5–6.0 mm. Generally orange yellow with most of dorsum black. Black are pedicel, flagellum, and spot on outer surface of scape of antenna, apex of mandibles, large area on frons and vertex except for yellowish inner orbits, area just above antennae, V-shaped mark between anterior ocellus and antennae, broad stripe from upper inner orbits to posterior postocellar furrows, and outer orbits to near top of eye; mesonotum except for stripe on each side of prescutum; metanotum; upper corner of mesepisternum; narrow lines on sutures of mesopleurae; basal plates and most of terga 2 and 3 and center of 4 except for lateral deflexed margins; and mid and hind tibiae and tarsi. Characters as for female. Genitalia in Figs. 4–6; inner margin of harpe rounded; apiceps of vosella with only minute teeth.

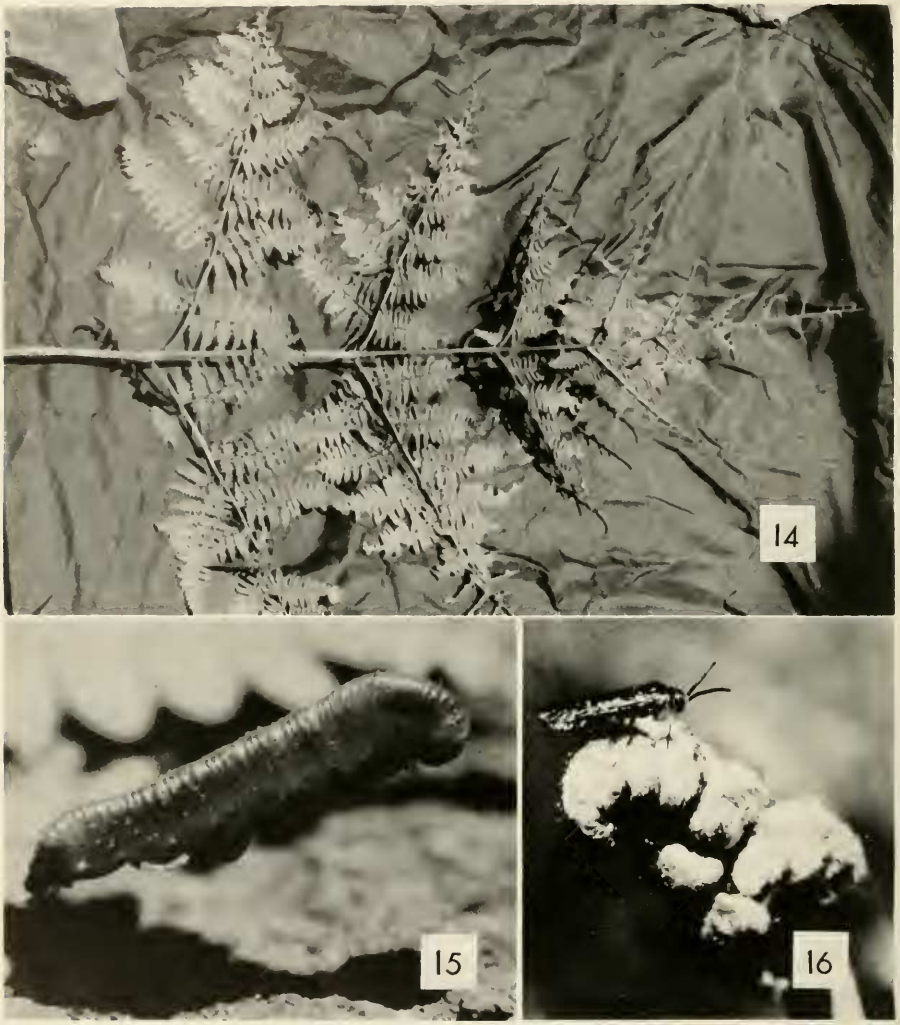
Larvae.—Late feeding stage, 13.0–17.0 mm in length. Whitish in preserved specimens, green when alive; head amber with darker brown mottled areas especially on vertex, upper ½ of frons, and behind eyes; black are eyespots, wings of spiracles, tarsal claws, tibiae, and minute body tubercles.

Head with very sparse, short, scattered hairs. Antenna conical, 5-segmented. Mandibles with teeth arranged as in Figs. 10, 11; maxilla in Fig.



Figs. 2, 3. *Eriocampidea chiapasensis*. 2, Sheath. 3, Lancet. Figs. 4–6. *E. arizonensis*. 4, Male genital capsule. 5, Volsella. 6, Penis valve. Figs. 7–9. *E. chiapasensis*. 7, Male genital capsule. 8, Volsella. 9, Penis valve. Figs. 10–13. Larva of *E. arizonensis*. 10, Right mandible. 11, Left mandible. 12, Maxilla. 13, Epipharynx.

12, lacinia with 6 to 8 stout spines; epipharynx in Fig. 13; labial palpus 3-segmented, prementum with 6 setae; labrum with 6 setae; clypeus with 6 Nsetae. Thorax with few tubercles on segments; prothorax without a pair o f fleshy protuberances. Abdominal segments 2 to 8 each with 7 annulets; annulets 2, 3, and 4, subspiracular lobe, and surpedal lobe each with one or more minute, blackish tubercles usually arranged as follows: 2nd annulet with 1 tubercle above spiracle; 3rd annulet with 1 tubercle behind spiracle; 4th annulet with 3 tubercles, the lower one behind spiracle; subspiracular



Figs. 14–16. *Eriocampidea arizonensis*. 14, Feeding damage on bracken fern. 15, Larva. 16, Male. (Photographs by J. H. Lawton)

and surpedal lobes each with 1 or 2 tubercles. Prolegs present on abdominal segments 2 to 8 and 10. Tenth tergum with few setae; subanal area with numerous setae.

Early feeding stage, 7.0–9.0 mm in length. Characters as above but with much darker coloration. Black are head; thoracic legs; wings of spiracles; apex of 9th tergum; most of 10th tergum; prolegs, at least on outer surface;

and tubercles of body as described above, but larger and appearing as small plates.

Host.—*Pteridium aquilinum* (L.) Kuhn, bracken fern.

Distribution.—Known from southern Arizona, southern New Mexico, and Durango, Mexico (Fig. 1). The associated males and larvae described above are from New Mexico, ski road from Alto to Sierra Blanca, 8000′ and 9500′, adults collected 22 May 1979 and 9 and 10 July 1979, larvae collected 26 June 1979 and 16 and 17 July 1979, by the junior author. The senior author has seen specimens from the following localities in Durango, Mexico: Buenos Aires, 10 mi. W. La Ciudad, 9000′, May 8, 1961; 24 mi. W. La Ciudad, 7000′, 4, 16, 20 July 1964; 6 mi. W. La. Ciudad, 9000′, 11 June 1964; El Salto, 10 mi. W., 9000′, 8, 9, 10, 12, 14, 20, 25 June 1964, 9, 15, July 1964; 3 mi. E. El Salto, 8500′, 18 July 1964; 10 mi. W. Durango, 9000′, 22 April 1961.

Life history.—In the Sacramento Mountains of New Mexico all adults and larvae were collected from bracken fern. There were two generations of adults, one during the last two weeks of May followed by a second in the first and second weeks of July. No adults were seen in the intervening period. Larvae appeared from eggs laid by the first generation of adults on 11 June 1979 and persisted until 28 June. Larvae of the second generation were first recorded on 16 July and remained until 2 August. The first (June) generation of larvae probably pupated and emerged immediately to give rise to the second (July) generation of adults, although other more complex life histories are possible.

Larvae feed on the outer portions of the pinnae of the host concentrating their attack towards the apex of the frond. Damage is sometimes extensive (Fig. 14). The species is most common on stands of bracken in open meadows at 8000 to 9000 feet, but a small number of larvae were also collected from fronds in *Pinus ponderosa*/*Quercus gambelli* forest at a similar altitude. Most bracken in the open meadows becomes tough and unpalatable by midsummer, and all second generation larvae were found on fresh, soft fronds regenerated after frost damage in the spring.

Adult males apparently outnumbered adult females by approximately 2:1 in both generations. A total of 29 males and 14 females were collected from bracken fronds (χ^2 under the null hypothesis of a 1:1 sex ratio = $5.23:0.05 < P < .01$, a ratio which general field observations suggest is quite normal). The reason for the apparent imbalance in the sex ratio is unknown.

Remarks.—The specimens from Durango, Arizona, and New Mexico are all similar in coloration and structure; in general, the specimens from Durango are slightly smaller than those from southwestern United States.

The larvae apparently change color from the early to late feeding stages. Young larvae have more black coloration as described above, whereas more mature larvae are much paler, have a more brownish head, and lack black

areas on the ninth and tenth terga, larger conspicuous plates on the body, prolegs, and thoracic legs.

Another bracken fern sawfly that has a similar distribution to that of *arizonensis* is *Aneugmenus scutellatus* Smith. The larvae of *scutellatus* can be separated from that of *arizonensis* by the presence of a pair of fleshy protuberances on the anterior margin of the pronotum, presence of numerous, long hairs on the head, lack of winged spiracles, lack of minute black protuberances on the body, and the uniform, pale coloration of the head.

Eriocampidea chiapasensis Smith, New Species
Figs. 1, 2, 3, 7–9

Female.—Length, 5.5-6.5 mm. Black; white to yellowish orange are clypeus, labrum and mouthparts except for apex of mandibles; narrow inner orbits to top of eye with hind orbits brownish; lateral angles of pronotum; tegulae; narrow posterior margin of abdominal terga, lateral downturned margins of terga, and sterna entirely; legs except for basal ¾ of coxae and infuscated to black tarsi. Wings hyaline to slightly dusky; veins dark brown, stigma pale brown. Structural characters as for genus. Sheath and lancet in Figs. 2, 3.

Male.—Length, 5.0–6.0 mm. Generally yellow with much of dorsum of head and thorax black. Black are antennal scape and flagellum; apex of mandibles; large area on vertex and frons not touching antennal insertions or eyes but extending through postocellar area to hind margin of head and excluding a V-shaped mark between antennae and front ocellus; small spot on upper corner of mesepimeron; mesonotum except for a stripe on each side of prescutum and sometimes a stripe on inner margin of each lateral lobe; basal plates and mesal area of terga 2, 3, and sometimes 4; and mid and hind tarsi, especially the apical 4 tarsal segments. Structure as for that of female. Genitalia in Figs. 7–9; inner margin of harpe protuberant; apiceps of volsella with 7–8 large teeth.

Larvae.—Unknown.

Holotype.—♂, "Mex., Chis., 9500 ft., Zontehuitz, nr. S. Crist., 27 May 1969, W. R. M. Mason." In the Canadian National Collection, Ottawa.

Paratypes.—*Chiapas:* Same data as for holotype (2 ♀♀, 1 ♂); same data as for holotype except 9600 ft., 25 June 1969 (1 ♂); 10 mi. NE San Cristobal, 5.V.69, 7500′, H. J. Teskey (1 ♀); 7200 ft., S. Cristobal las Casas, 21 May 1969, Malaise trap (1 ♀), same data, 29 May 1969 (1 ♀); 6 mi. E. San Cristobal, d.1.C., 2.V.69, J. E. H. Martin (1 ♀); 7200 ft., S. Cristobal las Casas, 13 June 1969; W. R. M. Mason (1 ♀); San Cristobal l. Casas, 4-25, 1959, 7500′, H. E. Evans (1 ♂). *México:* Real de Arriba, Temescaltepec, VI-10-33, H. E. Hinton, R. L. Usinger (1 ♀). *Michoacán:* Bosencheve, Rt. 15, km 129, July 7–8, 1965, Flint and Ortiz (1 ♀); Tancitaro, 6000 ft., July 20, 1941, H. Hoogstraal (1 ♀). *Oaxaca:* Tejocates, Rt. 190, km 491, Aug.

4, 1965; Flint and Ortiz (1 ♀). In the Canadian National Collection, California Academy of Sciences, Cornell University, Illinois Natural History Survey, and U.S. National Museum of Natural History.

Host.—Unknown.

Distribution.—Mexico (Chiapas, México, Michoacán, Oaxaca) (Fig. 1).

Remarks.—Except for coloration, the female is difficult to distinguish from that of *arizonensis*. Structurally, they are very similar, but the coloration of *chiapasensis* is much paler than that of *arizonensis*. In *chiapasensis*, the underside of the abdomen, entire orbits of the eyes, and legs except for part of the coxae and tarsi are all orange yellow. Distinct structural characters separating the two species are found in the male genitalia; these can be compared in Figs. 4 to 9. Note especially the structure of the harpes and volsellae. The penis valve of *chiapasensis* is very similar to that of *arizonensis* but not quite as curved.

The species name is based on the type-locality, the state of Chiapas, Mexico.

Key to Species

1. Female 2
– Male 3
2. Venter of abdomen yellow; legs mostly yellow except for coxae and middle and hind tarsi which are blackish; orbits of eyes entirely yellow ..... *chiapasensis*, new species
– Abdomen black with narrow posterior margin of each segment yellow; legs mostly black with apex of coxae, apex of femora, inner surface of front femur, and tibiae except for apical outer surface of hind tibiae yellowish; hind and outer orbits of eyes usually black to brownish ..... *arizonensis* Ashmead
3. Inner margin of harpe protuberant; apiceps of volsellae with large, distinct teeth (genitalia, Figs. 7–9) ..... *chiapasensis*, new species
– Inner margin of harpe rounded; apiceps of volsellae with small teeth (genitalia, Figs. 4–6) ..... *arizonensis* Ashmead

Literature Cited

Smith, D. R. 1969. Nearctic Sawflies II. Selandriinae: Adults (Hymenoptera: Tenthredinidae). U.S. Dep. Agric. Tech. Bull. 1398, 48 pp., 10 pls.